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**ILFORD**

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**HP4**

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**IN ACTION**

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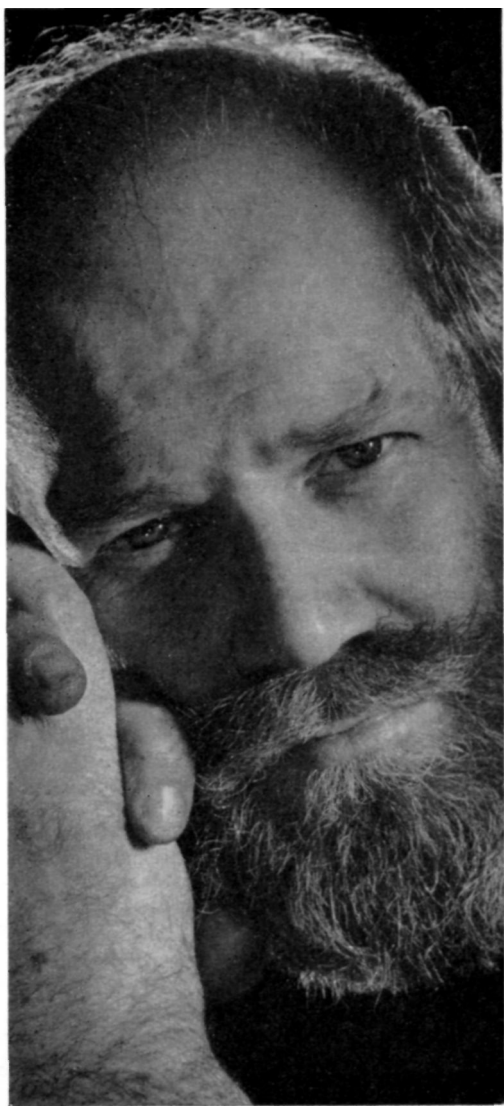
## Why HP4?

We're pretty proud of HP4, the latest in a line of famous Ilford high speed panchromatic films. And we're gratified by the way it has achieved such enormous acceptance among professional and press photographers -as well as advanced amateurs.

For when the chips are down, when quality must be maintained under all kinds of conditions, HP4 is the film you can count on.

Thousands of professional photographers do.





In a film of the class of HP4, speed is of primary importance to many users. This HP4 has in abundance - a daylight rating of 650 ASA when processing is done in Microphen, 400 ASA in ID-11 and most other developers. Under many conditions even higher ratings can be used and development time increased for maximum speed.

Grain is something that most photographers try to avoid. HP4, based on the most modern emulsion technology, has an excellent speed/grain ratio. Furthermore, a characteristic of this emulsion is that the grain is not only fine but *regular* - minimising its visual effect, even on large blow-ups.

Acutance? Another way of saying that HP4 negatives are really crisp. With its modern emulsion, HP4 is relatively free from irradiation, while the extremely efficient anti-halo backing minimises the dangers of halation.

HP4 was specifically designed for the professional photographer and advanced amateur, using the world's finest equipment. Yet its characteristics make the most of any lens, regardless of price. And the extra speed of HP4 lets you use the middle apertures, where lens performance is at its best, even in unfavourable conditions.

Latitude - or how far 'off' can you be in exposure and still get usable results? Naturally HP4 will give the best results when exposure and development are correct. But it is a very tolerant film. Occasionally everyone makes a mistake, and sometimes - when events are moving too rapidly - there may not be enough time to take a meter reading. This is when the latitude of HP4 is invaluable, 'pulling through' shots which might otherwise be unusable.



## Availability

Another particularly valuable HP4 characteristic is its high foot contrast. Put more simply, it means that HP4 gives exceptionally good tone separation in the shadow areas and maintains better tone rendering in the region of slight underexposure.

Above are just a few of the reasons why HP4 has been so enthusiastically received. Another is versatility. Many press photographers prefer to use just one type of film at all times, regardless of lighting conditions. And this is where everything we've just mentioned - fine grain, acutance, latitude and speed - really pays off.

Whether photographing a beauty queen on the beach or a night football match, the professional photographer knows he can depend on HP4 to give high quality negatives every time.

Any time, anywhere

That's what we mean by versatility.

HP4 is available as 35 mm, rollfilm and flat film.

The 35 mm user has a choice of 20 or 36 exposure cassettes, 36 exposure refills, or bulk rolls of 5 and 17 metres (16.4 and 56 ft).

HP4 rollfilm is frame numbered for the convenience of users and is available in both 120 and 127 sizes. Details of meter settings and development times are on the carton. Most 120 users will prefer the convenience of the Professional Pocket Pack - an attractively styled, convenient six-film pack which can be split down the centre perforation to produce two completely self-contained three-film units.

HP4 flat film is available in a number of popular sizes.

*Now that we've told you about the film, here is some detailed technical information about HP4 and how to use it.*

### METER SETTINGS

	processed in <b>ID-11</b>	processed in Microphen
daylight	400 ASA 27 DIN	650 ASA 29 DIN
tungsten	320 ASA 26 DIN	500 ASA 28 DIN

# Filters

HP4 responds well to all filters intended for use with black and white panchromatic films. To maintain the image sharpness which HP4 can give, only optically high quality filters should be used, free of physical damage and kept clean. Factors for exposure increase are given below as a practical guide for daylight and tungsten lighting. Minor variations of colour temperature (such as time of day for daylight, type of lamp for tungsten) can affect response, but are unlikely to be important in practice.

## Filter Factors

Ilford filter	daylight	tungsten
No. 104, Alpha (yellow)	1½	1¼
No. 109, Delta (deep yellow)	2	1½
No. 202, Micro 5 (deep orange)	5	2¼
No. 402, Gamma (yellow-green) 3½		4
No. 403, HW (bluish-green)	0	3½
No. 204, Tricolour Red	6	4
No. 304, Tricolour Blue	7	13
No. 404, Tricolour Green	6	6

# Flash

The tonal characteristics of HP4 make it particularly suitable for flash - either expendable bulb or electronic. Because of the high sensitivity of HP4 there is a danger of overexposure when working at close distances with direct flash; it may be preferable under such conditions to use bounce flash techniques indoors. By aiming the flash at a wall, ceiling or similar reflecting surface, the light reaching the subject is diffused and relatively even, giving a more natural effect.

Bounce flash exposures will vary according to the size of the room and type of reflecting surface - as well as flash intensity - and are best determined by experiment. In an average sized room, with light coloured walls and ceiling, a starting guide for experiment would be to halve the flash factor, i.e. open the lens aperture by two f stops, over direct flash

## Recommended Flash Factors in Feet for HP4

AG1,PF1 M2, MF1	AG1B, PF1B M2B, MF1B	Double Lite Blue	PF5 M3
230	230	340	340

## Development

The two standard developers for HP4 are ID-11 and Microphen, the latter being particularly recommended as it increases the effective speed in daylight to 650 ASA without any loss in quality.

Development times will naturally vary according to the type of negative desired and the tonal distribution of the subject photographed. Under average conditions development to  $G$  0.55 is satisfactory for tungsten enlargers with condenser illumination. Where other types of enlarger illumination are used a higher contrast may be desirable. For enlargers using cold cathode illumination  $G$  0.70 is recommended. The same degree of contrast is also suitable for enlargers with tungsten illumination using diffusing glass instead of condensers.

Times quoted are for development at 20°C (68°F). For development times at other temperatures use the chart on page 16, which is valid for HP4 in all Ilford developers.

## What is $\bar{G}$ ?

Contrast is a term freely used and understood, in practical terms, by most photographers. Some photographers have used gamma as a means of expressing contrast, but average gradient, or  $G$ , is preferred by Ilford Limited for films such as HP4, since it gives a more accurate indication of printing contrast when an average subject is photographed over the *entire* usable exposure limits of the material. Gamma measures contrast only over the middle densities (the straight line portion of the curve), while  $G$  takes into consideration the shadow and highlight areas.

To measure average gradient it is first necessary to choose two exposure limits on the characteristic curve - shadow and highlight - and draw a straight line between these two points. The slope of this line is the average gradient ( $G$ ). In calculating average gradient, Ilford Limited have set the exposure limits as being 1.5 log exposure units apart.

# 35 mm

Times given are for processing at 20°C (68°F) in a spiral tank with inversion agitation for the first ten seconds of development, and inversion once a minute for the remaining development time.

## CONTRAST TIME CURVES

### Exposure

1/30 second to standard sunlight through an intensity scale wedge

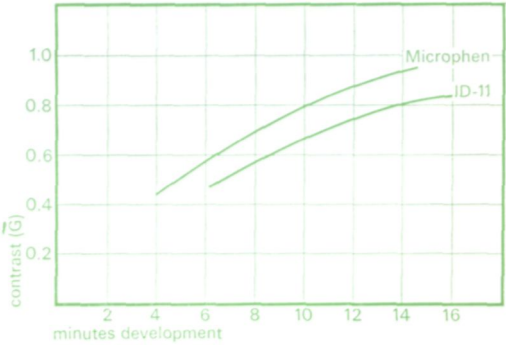
### Development

In a spiral tank at 20°C (68°F) using the recommended agitation

### Contrast (G)

Slope of straight line joining point on characteristic curve 0.1 density units above fog to point 1.5 log exposure units away

developer	time (minutes)	
	$\bar{G}$ 0.55	$\bar{G}$ 0.70
ID-11	7½	11
Microphen	5½	8





# Rollfilm

Times given are for processing at 20°C (68°F) in a spiral tank with inversion agitation for the first ten seconds of development, and inversion once a minute for the remaining development time.

## CONTRAST TIME CURVES

### Exposure

1/30 second to standard sunlight through an intensity scale wedge

### Development

In a spiral tank at 20°C (68°F) with agitation by inverting once a minute

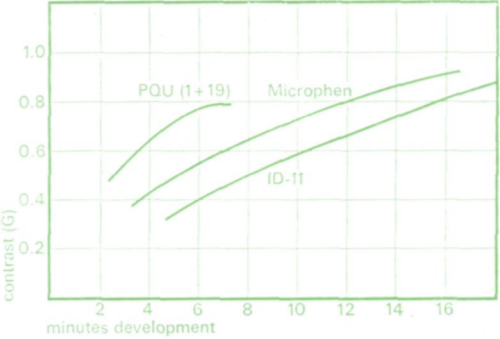
### Contrast (G)

Slope of straight line joining point on characteristic curve 0.1 density units above fog to point 1.5 log exposure units away

developer	time (minutes)	
	$\bar{G}$ 0.55	$\bar{G}$ 0.70
ID-11	9	12½
Microphen	6	9

For development by continuous agitation (e.g. in a dish) the following times should be used. Temperature 20°C (68°F).

developer	time (minutes)	
	$\bar{G}$ 0.55	$\bar{G}$ 0.70
ID-11	7	9½
Microphen	4½	7



# Flat Film

The times quoted for tank development are for thorough agitation for the first ten seconds of development and for five seconds at the end of every minute for the remainder of the development time. Times for dish development are based on continuous agitation. Specified temperature is 20°C (68°F).

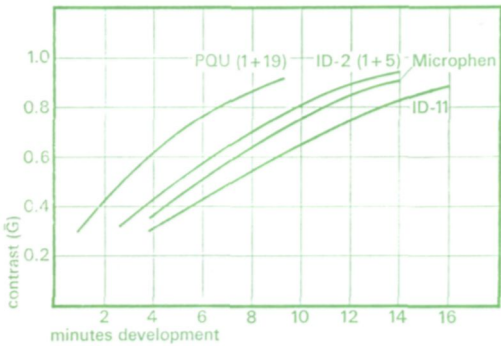
developer	dilution		time (minutes)	$\bar{G}$ 0-70
			$\bar{G}$ 0-55	
For general use				
ID-2	1+5	tank	5½	8
ID-2	1+2	dish	1½	2½
PQ Universal	1+19	tank	3	5
PQ Universal	1+9	dish	1½	2½
Autophen	—	tank	2½	4
Autophen	—	dish	2	3
For fine grain				
ID-11	—	tank	8	11
ID-11	—	dish	6½	8
Microphen	—	tank	6½	9
Microphen	—	dish	5	7

**CONTRAST TIME CURVES**

Exposure  
1/30 second to standard sunlight through an intensity scale wedge

**Development**  
In a deep tank or a dish at 20°C (68°F) using intermittent agitation

**Contrast (G)**  
Slope of straight line joining point on characteristic curve 0.1 density units above fog to 1.5 log exposure units away



## Safelight

HP4 is sensitive to light of all colours and should be handled in total darkness. An Ilford GB Safelight No. 908 (very dark green) in an Ilford darkroom lamp with the appropriate bulb may be used, but care should be taken not to allow direct light to fall on the film. It may be used to illuminate timing equipment, although direct light should not be allowed to fall on the film.

Although not recommended practice, some users may wish to develop by inspection, particularly where there is doubt as to whether a film has received correct exposure. In such cases development should continue in total darkness for at least 75 per cent of the normal immersion time, at which point a rapid inspection of the film under the Ilford GB Safelight No. 908 in a darkroom lamp may be desirable. It should be realised, however, that with the recommended bulb, illumination from this safelight is very low and, unless the eyes have had sufficient time in total darkness to become acclimatised, vision is unlikely to be adequate for any accurate estimation of negative density or contrast.

## Extended Development

Maximum foot (shadow area) speed is obtained by development in Microphen to G 0.9. Using intermittent agitation, this is achieved with a development time of 13 minutes for HP4 35 mm and roll-film, or 14 minutes for flat film, at a temperature of 20°C (68°F). Further development will build up contrast but not foot speed.

Ilford Limited does not normally recommend extended development except in emergencies, due to some loss of the fine quality of which HP4 is capable. However, a number of press photographers have claimed very high effective speed when development time is extended.

The suitability of extending development to G 0.9 will depend upon the tonal range of the subject, as well as the degree of known underexposure.

The accepted ASA method of determining film speed is based upon recording a full range of tones from shadow to highlight (a subject brightness scale of 128:1 is used as the basis of calculations). Where the brightness scale is more restricted, a higher than normal meter setting may be used with satisfactory results and development may be increased to raise negative contrast. By the same token, where shadow detail can be sacrificed a higher than normal meter setting may be used and a negative obtained which would, in the circumstances be considered acceptable.

Due to the enormous variation in exposure calculation methods among photographers, as well as variations in equipment, subjects and ideas as to what is an acceptable negative, specific information on extended development techniques is likely to be of little value in practice.

There is no doubt that HP4 responds remarkably well to extended development in cases of known underexposure. But when working outside the range of recommended technique it is essential that the user experiment to ensure that the results will be satisfactory for his purposes.

## Dilute Development

As an alternative technique where the recommended speed rating is used, HP4 may be developed in ID-11 or Microphen diluted 1+1 with water. The diluted developer should not be stored and is used only once with intermittent agitation. Users may find that greater consistency is obtained, since the developer is always fresh.

When a 1+1 dilution is used, development should be extended for 50 per cent longer than is used for undiluted developer to achieve approximately the same level of contrast. For example, 35 mm HP4 developed in ID-11 diluted 1+1 would require 11½ minutes with intermittent agitation at 20°C (68°F) for a contrast of G 0.55, against 7½ minutes for undiluted ID-11.

Using ID-11 diluted 1+1 has little noticeable effect on negative characteristics, although there is a slight increase in sharpness. For practical purposes, however, the decision between using ID-11 diluted or undiluted should be made purely on the grounds of operating convenience and economy.

With Microphen, a 1+1 dilution has been found to be particularly suitable for subjects with a long tonal range, such as weddings. It is often difficult in this type of work to maintain print detail in both the groom's dark suit and the bride's white dress. Usually it is necessary either to 'burn in' detail in the dress or to reduce contrast by using a lower contrast enlarging paper, which may produce a flat and lifeless print.

Correct use of the dilute Microphen technique can give negatives that will produce snappy prints without losing detail in shadows and highlights. Although weddings are an obvious example, the use of dilute development can be found useful for a whole range of subject matter, ranging from portraits to back-lit landscapes, with a long tonal scale. It is equally suitable for general purpose use whenever a one-time use, dilute developer is required.

## Fixation

After development, films should be rinsed and then transferred to a fixing bath. Ilford Hypam Fixer with Hardener is particularly recommended, due to its rapid fixing action and high capacity.

## Washing

After fixation, films should be washed in running water for 15-20 minutes. A final rinse in water, to which Ilford Wetting Agent has been added, will promote rapid and uniform drying. Films should be hung to dry in a dust-free atmosphere. Moderate heat may be used where rapid drying is essential.

## Enlarging

Produce a really great film and you need a really great enlarging paper to match. And that's Ilfobrom - the world's most advanced enlarging paper.

Just look at these advantages. Six evenly spaced contrast grades, uniform speed between them (except for grade 5, which is half the speed of the others) so you can change contrast but not exposure, uniform image colour throughout the contrast range - this is the paper that has everything.

We know that Ilfobrom is a perfect match to HP4. We're also convinced that no other enlarging paper is anywhere as good. Why not prove how right we are?

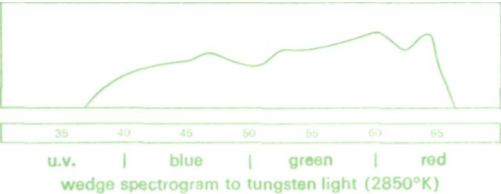
## Any Questions?

We hope that after reading this booklet you feel that you have all the information you need about HP4. If there is anything else you would like to know about HP4 or any Ilford product, contact Mike Williams, Amateur Service, Ilford Limited, Ilford, Essex

# Technical Specification

## Colour Sensitivity

Sensitive to ultra-violet and to all colours of the visible spectrum



## Reciprocity Characteristics

HP4 maintains its full speed with exposures from 1/5,000 second to 1 second, and for most purposes the quoted meter settings apply.

With any silver photographic material the reciprocal relationship between shutter speed and lens aperture does not apply at very long and very short exposure times. The corrections required for this with HP4 are shown below.

indicated exposure	corrected exposure
16 sec	48 sec
8 sec	18 sec
4 sec	7 sec
2 sec	3 sec
1/10,000 sec	+½ stop

# Characteristic Curves

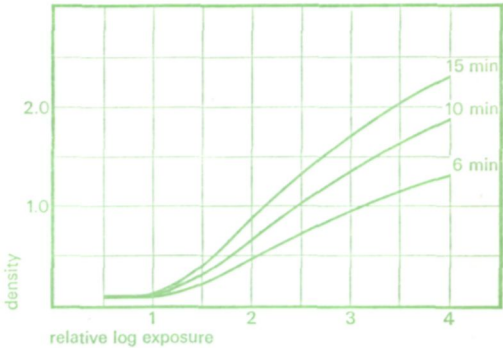
## 35 mm

### Exposure

1/30 second to standard sunlight through an intensity scale wedge

### Development

In a spiral tank at 20°C (68°F) with agitation by inverting once a minute



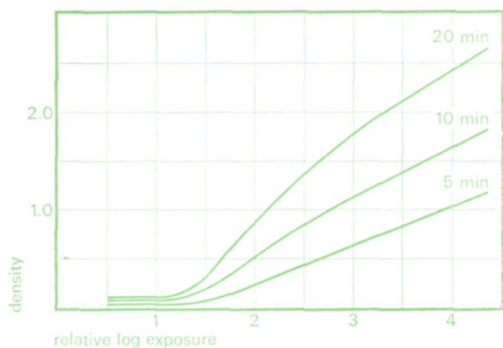
# Rollfilm

## Exposure

1/30 second to standard sunlight through an intensity scale wedge

## Development

In a spiral tank at 20°C (68°F) with agitation by inverting once a minute



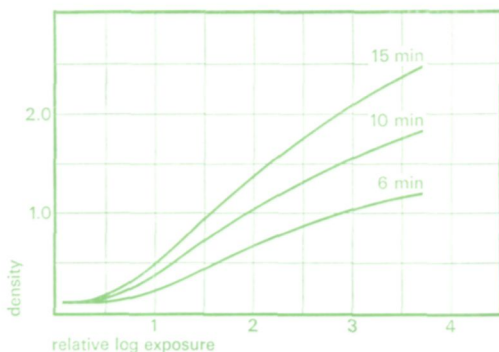
# Flat Film

## Exposure

1/30 second to standard sunlight through an intensity scale wedge

## Development

In a deep tank at 20°C (68°F) with agitation for the first 10 seconds of development and thereafter for 5 seconds every minute for the remainder of the development time, or in a dish using continuous agitation



# Time-Temperature Chart for HP4 Development

This chart can be used to find development times over a wide range of processing temperatures once the time recommended at 20°C (68°F) is known. The chart is valid for HP4 in all developers quoted.

To use the chart, first find the desired development time at 20°C (68°F). Then follow the diagonal line corresponding to this time to the point where it cuts the horizontal line representing the temperature to be used. The required development time will be found immediately below the intersection.

